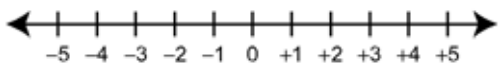
Represent Quantities with Integers

Integers include positive and negative whole numbers and zero.
An integer is any of the numbers
…, −3, −2, −1, 0, +1, +2, +3, … .



Integer chips are coloured disks that represent integers. A ⊕ represents +1, and a ⊖ represents −1.

- If you climb five steps, this amount can be represented by the integer +5.
- If you descend ten steps, this amount can be represented by the integer −10.

1. Use an integer to represent each quantity. Explain your reasoning.

a) an increase of 3%

b) 20 m below sea level

c) a drop of 8 °C

d) 15 marks higher

2. Suppose you win a prize of $15. Use an integer to describe what happens

a) from your point of view

b) from the point of view of the person giving the prize

Adding Integers

A **zero pair** includes one ⊕ and one ⊖.
A zero pair represents zero.
Integer addition can be modelled using integer chips or diagrams.

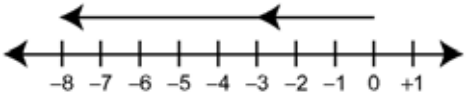
3. Use the diagram to complete each addition statement.

a) ⊕⊕⊕⊕⊕⊕⊕ ⊖⊖⊖⊖ (+7) + (−4) = ☐

b) ⊖⊖⊖⊖⊖⊖⊖⊖ ⊕⊕⊕ (−8) + (+3) = ☐

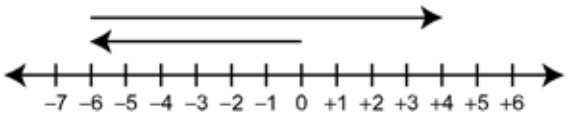
4. Use the diagram to complete each addition statement.

a)



(−3) + (−5) = ☐

b)



(−6) + (+10) = ☐

5. Complete each addition statement.

a) (+4) + (+5) = ☐ **b)** (−7) + (−7) = ☐

c) (+6) + (−9) = ☐ **d)** (−2) + (+8) = ☐

Subtracting Integers

Integer subtraction can be modelled using integer chips or diagrams.
Any integer subtraction can be completed by adding the opposite integer.

(+5) − (−4) = (+5) + (+4)
= +9

6. Use the diagram to complete each subtraction statement.

a)

(+7) − (+4) = ☐

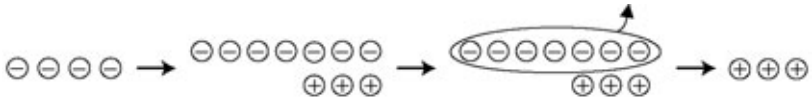
b)

(−6) − (−2) = ☐

c)

(−2) − (+6) = ☐

d)



(−4) − (−7) = ☐

7. Complete each statement.

a) (+4) − (+7) = (+4) + ☐

b) (−5) − (−2) = (−5) + ☐

c) (−8) − (+8) = (−8) + ☐

8. Subtract.

a) (+6) − (+1) **b)** (−3) − (+5)

c) (+2) − (−2) **d)** (−3) − (+2)

e) (−6) − (−9) **f)** (+4) − (−1)

Order of Operations

The correct sequence of steps for a calculation follows the **order of operations** shown.

8 ÷ 4 + (3 + 2) × 6 − 7	Do brackets first.
= 8 ÷ 4 + 5 × 6 − 7	Multiply and divide from left to right.
= 2 + 30 − 7	Add and subtract from left to right.
= 25	

9. Calculate.

a) 8 + 6 × 5 − 1 **b)** 24 ÷ 6 + 18 ÷ 2

c) 3 × (7 − 2) + 16 ÷ 4 **d)** (4 + 2) ÷ 6 + 6 × 3 − 3